phenomenon as simple — are clearly explained, and illustrated by experiments, sometimes new, always well arranged.

Lectures of this kind should have two objects, — to describe the phenomena, and state and explain the laws governing the science as fully as possible; and to give the audience an interest in the subject, and a curiosity that will lead to a further study of it. They should give an impulse toward thought, with some material for thinking on. So viewed, Professor Forbes has succeeded.

The first five lectures — on potential, electric currents, magnetism, electro-magnetism, and electro-magnetic induction — are extremely satisfactory: the last, on dynamo-electric machinery, would have been better omitted. It does not logically continue what has come before, nor is it, even considered apart from the other lectures, in any way as satisfactory as they are.

Taken as a whole, however, the lectures are to be commended for the clearness of exposition, accuracy of statement, and the very interesting way in which they are written.

NOTES AND NEWS.

A CYPRUS Exploration Fund has been formed in London, the object of which will be to carry on archæological researches similar to those of the Palestine Exploration Fund. The committee of this fund have applied to the high commissioner of Cyprus for permission to excavate in the island. This application was supported by a special resolution addressed to the secretary of state for the Colonies by the trustees of the British Museum. Permission has now been obtained in respect of one site, the village of Kouklia, which stands on the site of the ancient Paphos; and operations have begun there, on a large scale, which promise to yield results of exceptional interest, the special object in view being the great temple of Venus. The work is being carried out by students of the British School at Athens, under the supervision of the director, Mr. Ernest Gardner, whose services, and a contribution of £150, were placed at the disposal of the Cyprus Exploration Fund by the managing committee of the school. The same sum has been contributed respectively by the University of Cambridge (from the Worts Travelling Fund), the University of Oxford, and the Society for the Promotion of Hellenic Studies. Individual subscriptions amounting to upwards of £600 have been received.

— George S. Mackenzie, secretary of the Emin Pacha Relief Committee, publishes the following news, which was sent by mail from Zanzibar: "It is reported in the *Bazaar* here that Tippo-Tip, after some delay, has sent a number of his men to Mr. Stanley's camp on the Aruvimi." This news, which is published with some reserve, is very gratifying, as it shows the desire of Tippo-Tip to carry out the engagements he entered into with Stanley. The arrival of Tippo's party would enable Major Barttelot to despatch without delay the ammunition and reserve stores from the camp of Yambuga, at the mouth of the Aruvimi, to Wadelai. Although Stanley's progress was evidently not as rapid as was assumed in the plan, it is not necessary to entertain serious apprehensions as to the safety of his expedition. When it was stated that news of Stanley would probably reach us early in March, it was assumed that the steamers of the Kongo Association would visit the stations at Aruvimi and Stanley Falls. The steamer 'Stanley' was to be despatched to these places under the command of Captain van der Velde. Unfortunately this able officer died at Leopoldville a few weeks ago, his death being announced in the latest issue of the *Mouvement Géographique*. He explored the lower Obangi and its tributaries, the Itimbiri, and made an unsuccessful attempt to reach the Welle, starting near the most northern point of the great bend of the Kongo. His death has delayed the expedition to Stanley Falls, and for this reason it is assumed that the first news of Stanley will reach us *via* Zanzibar. As, however, communication between the Mvutan Nsige and the coast is very irregular, it is hard to tell when definite and reliable news will reach us.

— On Feb. 17 the first memorial erected to a public man in the Brighton Museum was unveiled there in the shape of a marble medallion portrait of the late distinguished scientist, Dr. Thomas Davidson, the first chairman of the museum committee, and whose lifelong study of brachiopoda won for him a foremost name in the ranks of paleontologists.

LETTERS TO THE EDITOR.

The Snow-Snake and the r-Sound.

THE evidence on the Southern use of the snow-snake is certainly not what was expected, and, with my experience of Indian traditions, is not satisfactory. Passing by this, I will mention two things noticed while on the reservation to-day. Many Seneca snow-snakes are now made there, and these differ from the Onondaga in being flat on the opposite surfaces, with the edges slightly rounded. A good crust being lacking, an enterprising Indian had made a gutter in the snow by the roadside, about fifty rods long, and was getting a little money by its use from a number of boys.

I looked up the name carefully. It had been written for me, as before stated, and I had somewhat hastily asked several its name when last there, without noticing any discrepancy. Now, it appeared that Mr. Hewitt was partially right; but every man, woman, and child gave it as *ka-when-tah*, or *ka-wen-tah*, changing the supposed *r* into *n* uniformly, and sometimes hardening the *k* into *g*. As I paid special attention to the second syllable, my own orthography stands corrected in this case, and that of Mr. Hewitt also. I also corrected one other word in which I made a similar error in some casual work.

In testing the version of the Lord's Prayer given me, a second time, the question is not so clear. I am not in the least troubled with *otosis*, and had used reasonable care, but without regard to the objection now made. The first three instances in which I then retained the letter may be called doubtful. I went over them again with my old friend Albert Cusick, and although the letter seemed there as the words were read, — and perhaps ordinary speech is the true test, — yet the sound almost disappeared when each syllable was taken by itself. In the fourth, where a clause was paraphrased rather than translated, there is less room for uncertainty. The sound is fuller, and is not readily dispensed with. But for its rarity elsewhere, I certainly should retain it there.

The last test I used was with the numerals given by Schoolcraft in his Onondaga vocabulary. He credits some words in it to the Mohawk. I do not remember that he does these, but they are not of the Onondaga language. In the first ten Onondaga numerals, *r* does not occur.

It is evident, of course, that Zeisberger incorporated many Mohawk words in his Onondaga lexicon, and his early study of that tongue perhaps sufficiently accounts for this; but how he could have spent the time he did at Onondaga, for the sole purpose of studying the language, and yet used this letter so much, and even in proper names, without its partial use by the central nation, is not easily understood.

One of the eminent authorities cited for the early disuse of the letter seems merely to quote from another, but some historical facts may have been overlooked. The Jesuit missions at Onondaga were abandoned late in the seventeenth century, though the missionaries sometimes came there very early in the eighteenth. In preparing a list of historic Onondagas, I took notice of a half-century of this *post-Jesuit* period. From 1725 to 1775, I found the names of fifty-seven Onondagas, and twenty-three of these contained the letter *r*. *Teyawarunte*, an Onondaga sachem, was speaker in 1775, as he had been long before. The year previous, the Onondaga sachems had a private audience with the new Indian agent, Col. Guy Johnson, and some of their distinguished men were presented to him. In the names of four out of the eight mentioned, is found the nominally obsolete letter. Here I leave the question.

W. M. BEAUCHAMP.

Baldwinsville, N.Y., March 8.

Needed — An Improved Means of attaching Microscopical Objectives.

THE recent interesting discussion in *Science* regarding the defects of existing microscopes ought to lead to practical results. While the subject is under consideration, every detail ought to be passed under review, or rather studied *de novo*, accepting no legacies of the past, no matter how useful they may have been in their day, provided we can find better devices. One very important thing to be considered is the means whereby objectives are to be attached to the tube of the microscope. Obviously, what we need for this purpose is a device so simple it can be easily manufactured and

used, — one that is durable, and not liable to get out of order; which will fix the objective firmly in position, and yet will permit it to be attached or removed with the least possible expenditure of time and energy. It must be admitted that the screw meets all these requirements except in the important matter of attaching and removing the objective. The screw is not an expeditious mode of attachment, although it may be improved by lessening the number of the threads so that only one or two turns of the objective tube would be needed in order to bring it to position. Most objects require to be studied under different amplifications, and the time spent in changing from one to another is a real loss. Most working microscopists will begrudge every second spent in changing, not only because their time is valuable, but also because an object may thus be lost, at least for a time, especially if it is a moving object. If it is possible, objectives should be attachable and removable without having to draw back the tube of the microscope or disturb the object. This is accomplished by the revolving nose-piece, but under the disadvantage of being somewhat bulky; also it answers for only two or three powers, and leaves the unused objectives exposed to the dust. The Facility nose-piece, the Zentmayer cut-away nose-piece, etc., show that objectives can be attached more quickly than by the ordinary screw; yet, like the screw, these devices require drawing back the tube in order to be attached. It will be a great gain if some way can be devised whereby each objective can be easily and instantly slid into place from the side, the new objective pushing out the one in former use as it is itself pushed in. This would probably involve a square or rectangular plate fixed to the top of the objective, sliding in ways fixed to the instrument tube, or some other equivalent arrangement. It is not, however, my present purpose to discuss the ways and means for gaining the important end of attaching the objective by some more speedy device than the screw, only to call attention to the subject. If no device superior to the screw can be found, by all means, let the fittest survive. On the other hand, it is neither mechanical, nor in the end economical, to let the screw, because it is already in the field, stand in the way of a better device. At the present time both microscopists and manufacturers are agreed on the society screw, and those who prefer nose-pieces have to go to the expense of providing adapters. It will be no more than fair to change the programme. Suppose we agree on some standard form and size of nose-piece, and let those who prefer screws provide the adapters.

By having the nose-piece attached directly to the objective tube, we would do away with screws entirely, also all need of adapters except to tubes already provided with screws.

It may be objected that there are so many possible ways of attaching objectives, that there is no probability of coming to an agreement upon a single standard size and form of attachment whereby the objectives of all makers could be used on every microscope, as they are under the present arrangement of the society screw.

In reply it may be said that we cannot know this until after the attempt has been made. If American microscopists take concerted action for making their needs known, it must result in a great many suggestions as to the proper mechanical devices for securing the desired ends. The resources of mechanicians were not exhausted when the screw was invented. I believe it is only a question of time when the ordinary screw will be replaced by some more expeditious device, perhaps by some form of sliding collar, or, if the term be preferred, by the American nose-piece.

G. H. Stone.

Colorado Springs, Col., March 16.

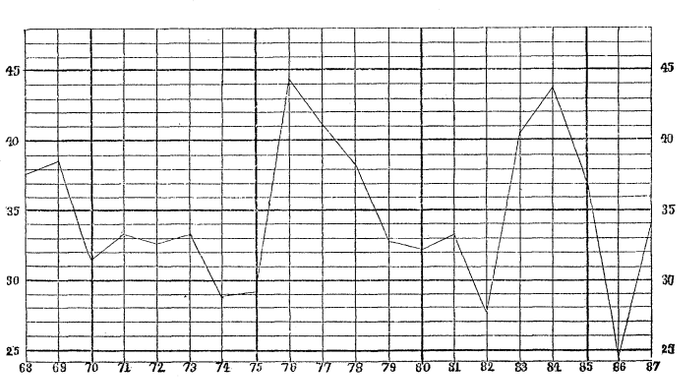
Is the Rainfall increasing on the Plains?

In your issue of March 2, I observe the statement attributed to the chief signal officer, corroborating "the prevalent opinion that the rainfall in the West is increasing," while Mr. Henry Gannett "dismisses this popular idea as baseless." My own opinion is decidedly in favor of the affirmative of this question. My personal observations for twenty years at this point indicate the existence of a rainfall cycle of about seven years in duration, each septennial period including two or more consecutive years of precipitation above the average, and a similar series of years with precipitation below the average. A seven-year cycle is also illustrated in the Fort Leavenworth rainfall, whose records cover double the period of my own observations at Lawrence. Recognizing the existence of this cycle, it will require a minimum series of fourteen years of records to warrant a division of the period into two equal parts for the purpose of determining the question of an increase of rainfall. I would therefore eliminate from Mr. Gannett's list all but nine of the twenty-six stations. At these stations the aggregate increase of precipitation in the second half of the periods of observation is 109 inches, which gives an average annual increase of 1.28 inches for the nine stations. This is certainly a decided increase, although the average period of observation is only nineteen years.

But the length of the period of observation at Fort Leavenworth is thirty-nine (instead of twenty-eight, as given in Mr. Gannett's table), — from 1836 to 1874. A study of this series of observation is of great interest, since it is the largest series in our possession, and especially since its division into two equal parts throws the first half entirely into the period preceding the settlement of Kansas, while the second half is placed entirely within the period of settlement of this great Commonwealth. The total precipitation in the first half of this period (ending June 30, 1855) was 592.84 inches, giving an annual average of 30.40 inches, while in the second half (ending Dec. 31, 1874) it was 696.29 inches, giving an annual average of 35.70 inches. This shows a total increase of 103.45 inches, or an average annual increase of 5.30 inches. This is assuredly a change worthy of notice, involving an increased precipitation of more than seventeen per cent.

My figures concerning the Fort Leavenworth rainfall are derived from a transcript of the records furnished by Prof. Joseph Henry of the Smithsonian Institution, and published in the 'Annual Report of the Kansas Board of Agriculture for the Year 1874.' In this transcript there are no records for 19 of the 468 months of the 39 years. Five of these blanks occur in the first half of the period, and have been filled by inserting the average precipitation for the months in question. Twelve of the blanks occur in the second half of the period, and have been filled by inserting the actual rainfall for those months at Lawrence, Manhattan, and Fort Riley, all of which stations are within about one hundred miles of Fort Leavenworth, and have a smaller rainfall than that of Fort Leavenworth.

The following diagram is appended as exhibiting more clearly this periodicity according to my observations at Lawrence: —



ANNUAL RAINFALL AT LAWRENCE, KAN., 1868–87.

A similar platting of the Fort Leavenworth rainfall exhibits six periods of excessive precipitation, separated by intervals of seven years, and alternating with periods of deficient precipitation, in the same manner as in the above diagram of the Lawrence rainfall.

F. H. Snow.

Lawrence, Kan., March 13.

Bacteriology in our Medical Schools.

In connection with the subject of bacteriology in the schools, it should be stated that Johns Hopkins University, though it has not yet established a medical course, has organized a pathological institute. In this institute the subject of bacteriology is thoroughly taught in the most approved manner by a competent board of instructors.

H. W. Conn.

Middletown, Conn., March 21.